PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

17

Applicant's or agent's file reference 112145.8 RS	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IL98/00403	International filing date *(day/month/year)* 24/08/1998	Priority date *(day/month/year)* 15/10/1997

International Patent Classification (IPC) or national classification and IPC

G06F17/24

Applicant

MULTITEXT LTD. et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the report

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement

VI ☐ Certain documents cited

VII ☒ Certain defects in the international application

VIII ☒ Certain observations on the international application

Date of submission of the demand 12/04/1999	Date of completion of this report 2 1. 01. 00
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Mengele, S Telephone No. +49 89 2399 2720

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IL98/00403

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-16   as originally filed

Claims, No.:

1-21   as originally filed

Drawings, sheets:

1/1   as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description,   pages:

☐ the claims,   Nos.:

☐ the drawings,   sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

2. Citations and explanations

   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

   see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

   see separate sheet

1.   ad section V:

1.1   When the term "text dimension" as given in independent Claims 1, 6, 11 and 16 is interpreted and clarified in the sense of the description of the present application (see in particular page 2, line 15 to page 3, line 26), the subject-matter Claims 1, 6, 11, 16 and 21 is neither known from nor rendered obvious by the prior art cited in the International Search Report:

EP-A-0 230 616 discloses a technique for controlling document versions such as different versions of computer programming code. In that prior art a so-called SDB file stores the original document and associated delta records of any changed, added or inserted lines for each new version created, and a so-called LVC file contains control record data for each version. That prior art does not suggest to **assign values of "text dimensions" to a selected text segment**, in order to produce a so-called multi-layer text, as it is specified in Claim 1 and Claim 11, respectively, but rather merely indicates whether given document lines were deleted, inserted, changed or unchanged compared with the previous version. The present invention as specified in Claims 6 and 16 provides **simple and fast** retrieval of text segments **where at least one value of at least one "text dimensions" is input and text segments are retrieved that have an assigned value that meets the input value.** In contrast, the cited prior art requires exhaustive incremental processing of the SDB and LVC files through all interim versions until a desired document version is created.

Similarly to the first document of the International Search Report, EP-A-0 483 039 concerns version control software. That prior art provides a relational data base table in which the different versions of data can each have a different engineering change status, enables users to create versioned objects by logical key grouping of data elements and acts upon the logical keys and special versioned attributes of these objects for the proper specification and selection of object instances during creation, update or retrieval processing.

1.2   Dependent Claims 2 to 5, 7 to 10, 12 to 15 and 17 to 20 specify embodiments of the respective independent claims to which they refer.

2. **ad section VII:**

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in EP-A-0 230 616 is not mentioned in the description, nor is this document identified therein.

3. **ad section VIII:**

The application does not meet the requirements of Art. 6 PCT since the present set of claims is not clear in the following respect:

3.1 Claim 1 is wide enough in scope to cover the case where the method as claimed is performed exclusively by a human being using pencil and paper. It is understood that the method of Claim 1 is computer-implemented. Any different solution is not supported by the description.

3.2 It is understood from the description (see in particular page 2, lines 15 and 16 and page 3, lines 10 to 14) that a "text dimension", as claimed in the independent claims, refers to any desired domain and includes information on one related text layer.

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 18 May 1999 (18.05.99)	
International application No. PCT/IL98/00403	**Applicant's or agent's file reference** 112145.8 RS
International filing date (day/month/year) 24 August 1998 (24.08.98)	**Priority date** (day/month/year) 15 October 1997 (15.10.97)
Applicant SOBOL, Idan	

1. The designated Office is hereby notified of its election made:

    [X] in the demand filed with the International Preliminary Examining Authority on:

    12 April 1999 (12.04.99)

    [ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

    [ ] was not

    made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Lazar Joseph Panakal

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 18 May 1999 (18.05.99)	
International application No. PCT/IL98/00403	**Applicant's or agent's file reference** 112145.8 RS
International filing date (day/month/year) 24 August 1998 (24.08.98)	**Priority date** (day/month/year) 15 October 1997 (15.10.97)

Applicant

SOBOL, Idan

1. The designated Office is hereby notified of its election made:

    [X] in the demand filed with the International Preliminary Examining Authority on:

    12 April 1999 (12.04.99)

    [ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

    [ ] was not

    made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Lazar Joseph Panakal

Telephone No : (41 22) 338 83 38

WRITTEN OPINION

(PCT Rule 66)

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

REINHOLD COHN AND PARTNERS
P.O. Box 4060
61040 Tel Aviv
ISRAEL

Date of mailing *(day/month/year)*	1 9. 07. 99

Applicant's or agent's file reference	REPLY DUE	within 3 month(s) from the above date of mailing
112145.8 RS		

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IL98/00403	24/08/1998	15/10/1997

International Patent Classification (IPC) or both national classification and IPC

G06F17/24

Applicant

MULTITEXT LTD. et al.

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1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

I	☒	Basis of the opinion
II	☐	Priority
III	☒	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	☐	Lack of unity of invention
V	☒	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	☐	Certain document cited
VII	☒	Certain defects in the international application
VIII	☒	Certain observations on the international application

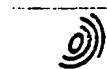3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3.
For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 15/02/2000.

Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer / Examiner Mengele, S
	Formalities officer (incl. extension of time limits) Schall, H Telephone No. (+49-89) 2399 2647

Form PCT/IPEA/408 (cover sheet) (January 1994)

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-16   as originally filed

Claims, No.:

1-21   as originally filed

Drawings, sheets:

1/1   as originally filed

2. The amendments have resulted in the cancellation of:

    ☐ the description,   pages:
    ☐ the claims,   Nos.:
    ☐ the drawings,   sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

    ☐ the entire international application,

    ☒ claims Nos. 21,

because:

    ☒ the said international application. or the said claims Nos. 21 relate to the following subject matter which does not require an international preliminary examination (*specify*):

see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1,6,11,16
Inventive step (IS)	Claims	2-5,7-10,12-15,17-20
Industrial applicability (IA)	Claims	

2. Citations and explanations

   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

   see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

   see separate sheet

1.   ad section III:

Claim 21 specifies a text file on any conventional memory medium, i.e. matter which according to Art. 34(4)(a)(i) and Rule 67.1(v) PCT need not be examined.

2.   ad section V:

Reference is made to the following document:
D1 = EP-A-0 230 616.

2.1   The prior art disclosed in D1 (see page 3, lines 1 to 36 and page 4, line 9 to page 5, line 19 with Figs. 1 to 3) comprises already all features specified in Claims 1, 6, 11 and 16, respectively, with the SDB file (102) of D1 corresponding with the claimed multi-layer (multi-level) text, the content of the original document as well as the content of each delta record of D1 corresponding with a claimed text segment and each LVC file record number (LV#1,...LV#N) of D1 corresponding to a claimed text dimension.
Hence, the subject-matter of independent Claims 1, 6, 11 and 16 lack novelty.

2.2   The implementation details introduced in dependent Claims 2 to 5, 7 to 10, 12 to 15 and 17 to 20 appear to lie within the normal design activity of the skilled person. That is, those dependent claims do not appear to contain any additional features which involve an inventive step.

3.   ad section VII:

3.1   Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

3.2   The independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case appears appropriate, with those features known in combination from the prior art (document D1) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT). If, however, the applicant is of the opinion that the two-part form would be inappropriate, then reasons therefor should be provided in the letter of reply. In addition, the applicant should ensure that it is clear from the description which features of the claimed subject-matter are known from document D1 (see the PCT Guidelines PCT/GL/3 III, 2.3a).

4.   **ad section VIII:**

The application does not meet the requirements of Art. 6 PCT since the present set of claims is not clear in the following respect:

4.1   Claim 1 is wide enough in scope to cover the case where the method as claimed is performed exclusively by a human being using pencil and paper. It should be clarified that the method of claim 1 is computer-implemented. Any different solution is not supported by the description.

4.2   The statement at the penultimate paragraph of page 16 renders the order of steps in the claims unclear. The claimed order of steps appears to be however the only one which is logical and clearly supported by the detailed description and drawings.

4.3   The terms "multi-layer (multi-level) text" and "text dimension" as introduced in the independent claims have no well-defined meaning. In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as originally filed on which these amendments are based (see also Rule 66.8(a) PCT). If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

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**Europäisches
Patentamt**

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Patent Office**

**Office européen
des brevets**

Generaldirektion 2   Directorate General 2   Direction Générale 2

Correspondence with the EPO on PCT Chapter II demands

In order to ensure that your PCT Chapter II demand is dealt with as promptly as possible you are requested to use the enclosed self-adhesive labels with any correspondence relating to the demand sent to the Munich Office.

One of these labels should be affixed to a prominent place in the upper part of the letter or form etc. which you are filing.

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09/529348

527 Rec'd PCT/PTO 13 APR 2000

September 26, 1999

> **FAX TRANSMISSION OF
> 7 PAGES**
>
> **TO: 0049 89 2399 4465**

European Patent Office
D-80298
Munich

Attention: Examiner Mengele S.

Dear Mr. Mengele,

> **Re: Reply to Written Opinion
> PCT Patent Application No. 98/00403
> in the name of Multitext Ltd.
> Our Ref: 112145-8 EH (Please quote)**

We enclose herewith our reply to the Written Opinion of July 19, 1999.

We would like to bring to your attention that this case is of significant commercial importance to our client. If you still uphold your objection or require clarifications, we would appreciate your providing us with the opportunity to discuss the matter before you issue your Written Report.

In this case, please advise us when it is convenient for you, and we shall contact you by telephone.

Please note, however, that I shall be out of the office from September 30 – October 14, and I would appreciate your setting up a conference call accordingly.

Yours very truly,
REINHOLD COHN AND PARTNERS
By:

Ehud Hausman

EH/jz/00025

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1899-1973

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Established 1934

Reinhold Cohn & Partners
Patent Attorneys

September 26, 1999

European Patent Office
D-80298
Munich

Attention: Examiner Mengele S.

Dear Sirs,

> **Re: Reply to Written Opinion**
> **PCT Patent Application No. 98/00403**
> **in the name of Multitext Ltd.**
> **Our Ref: 112145-8 EH (Please quote)**

In reply to a Written Opinion dated July 19, 1999, we would like to comment as follows:

Section III:

The Examiner's objection will be dealt with during the prosecution of the present application in the National Phase, according to the specific laws and regulations of each designated state.

The same applies to **Section VII, Subsections 3.1, 3.2, Section VII, Subsection 4.1.**

In **Section V, Subsection 2.1,** the Examiner contends that *"the prior art disclosed in D1 (see page 3, lines 1 to 36 and page 4, line 9 to page 5, line 19 with Figs. 1 to 3) comprises already all features specified in Claims 1, 6, 11 and 16, respectively, with the SDB file (102) of D1 corresponding with the claimed multi-layer (multi-level) text, the content of the original document as well as the content of each delta record of D1 corresponding with a claimed text segment and each LVC file record number (LV#1,...LV#N) OF D1 corresponding to a claimed text dimension. Hence, the subject-matter of independent Claims 1, 6, 11 and 16 lack novelty."*

Before turning to the Examiner's objection on the merits, Applicants believe that a brief overview of the invention as claimed and the method of the cited D1 publication, would be helpful in understanding the improvements of the invention as defined in the claims over the cited D1 publication. Thus, the invention provides for a method for creation and use of a so-called multi-layered text representation, which enables to work in a single layer but achieve a multi-layer effect and thereby easily retrieve data according to a desired "text dimension" or "text dimensions" and avoid complicated parsing methods. The user selects an input dimension, and thereby focuses on the desired aspect of the text. Thus, as described, for example, in pages 2, lines 23-24, in the case of time dimension, the user can specify a time range of interest, and any text portion in the multi-text presentation that meets the specified range of dates is retrieved. Consider, for example, a given law, say a law of contracts which underwent revisions several times over the years, with the consequence that different law versions apply to different periods of times. If a lawyer is now interested in getting the versions that apply to a given date, the system of the invention facilitates the immediate retrieval of the relevant version of the law that applies to this particular date. The multi-text representation stores the relevant data of all the revisions, and therefore one simply has to designate the dates of interest, and the system retrieves the text portions that apply to this date.

The invention is not bound to time dimensions, and other non-limiting examples of dimension of place, spokesperson dimension and reference dimension are mentioned (see e.g. page 2, line 25 and page 3, line 9). Additional examples that pertain to time and place dimensions are provided on pages 8, line 9 through page 12, line 16, and on page 14, line 18 through page 16, line 6.

The invention further describes and claims a method for generating specified multi-layered text where dimension value or values can be assigned to any desired text segment words, sentences (or any other text portion). It is accordingly appreciated that after generating the multi-layered text, it embodies all the relevant dimensions, and the user can retrieve at a relatively negligible processing overhead the text of interest by simply stating the dimension values of interest. There is no need to maintain any specific order of versions.

In accordance with the cited D1 publication, there is provided a method for improving library management systems stored in computer storage. In fact, the D1 publication discloses a technique for controlling versions, in particular of computer programs by keeping track of all modifications that were effected *vis a vis* the previous versions. In accordance with the example of version control of the D1 publication, it is not required to store the entire contents of each version, but rather only the modifications (Delta). The recreation of the current version based on the specified Delta data is time consuming, and in accordance with the D1 publication, an improved approach is offered in order to reduce the overhead associated with recreation of the current version. (See discussion on page 2, lines 32-53). The specific proposal of the cited D1 publication for accomplishing version control includes a so-called SDB file for holding the original document, and associated Delta records which specify the modification of each version. The Delta records are linked to the so-called LVC files, which specifies, *inter alia*, whether a given line has been deleted, inserted, changed or left intact (matched) (see Fig. 3 for structures of SDB and LVC files, and Fig. 2 for the contents of control record data.)

It is accordingly appreciated that in accordance with the D1 publication, there is provided editing trace data which specifies what lines were inserted, deleted or changed, *vis a vis* the previous version. This is done in an incremental manner, such that each LV#i holds the relevant data *vis a vis* the previous LV#i –1. It readily arises that in the case of many versions, in order to construct the current version, a relatively exhaustive process should be activated through all the interim versions. In other words, for N versions (see Fig. 3), all the preceding N-1 LV records should be processed one at a time, before the last version is obtained.

The recreation process is described in detail with reference to Figure 6, where as shown, the procedure is repeated until all LVC records are processed (see the loop processing of Blocks 238, 240 and 242.) The processing of each command is elaborated in Figs. 12 (for match routine), 13 (for delete routine) and 14 (for insert routine) (See also p. 7, lines 25-35).

To summarize, the D1 publication discloses a version control technique which lists the line status for each version in an incremental manner. It requires that the status applies to line boundary, and requires the recreation and exhaustive processing through all the interim versions in order to obtain the current version.

Therefore, unlike the invention as defined in claim 1, the D1 publication does not aim at generating a multi-layer text, but rather aims at implementing a version control system. It does not enable to select a text segment where the latter stands for any desired text portion, but rather operates on a static line boundary. It does not enable assigning the values of text dimension to the specified text segment, but rather merely indicates whether given lines were deleted, inserted or changed *vis a vis* the previous version. Obviously, it does not enable to retrieve data in the manner defined in claim 6, (at only minimal computational overhead), where a value or values of desired text dimensions are defined, and in response, the text that complies with the specified values is retrieved. The procedure according to D1 does not enable to input desired values of dimensions, but rather

enables to obtain the current version of the text by exhaustively processing the SDB file and LVC file in an incremental manner, until the current version is obtained.

Applicants therefore respectfully submit that the invention as defined in independent claims 1 and 6 (directed to a method) and 11 and 16 (directed to a system) is deemed novel and non-obvious over the cited D1 publication. Applicants further maintain that dependent claims that are appended directly to or indirectly to the specified independent claims add additional features which further distinguish the invention as defined in the respective dependent claims over the cited D1 publication.

Section VIII
Subsection 4.2

In this section, the Examiner contends that *"the claimed order of steps appear to be, however, the only one which is logical and clearly supported by the detailed description of the drawings"*. Applicants respectfully traverse the Examiner's contention. According to the literal language of claim 1, the following order or steps applies: (a), (b), (c), (a), (b), (c)...

However one out of many non-limiting orders that is embraced by claim 1 is (a), (b), (b), (b), (c), (c) (c)... (namely three text segments are selected and only then values are assigned to each one of them respectively.)

Subsection 4.3

In Section 4.3, the Examiner contends that the terms "multi-layer text" and "text dimension" have no well defined meaning. The term "text dimension" corresponds to the term "dimension" defined in the glossary, and the term "multi-layer text" indicates the result of applying steps a-d (see claim 1) to the input text that is provided in step (a.) The procedure of producing the multi-layer text is described in detail throughout the entire description (p. 2, line 11 through page 16, line 6).

Ehud Hausman, Patent Attorney

EH/jz/00021

PATENT COOPERATION TREATY

To:

REINHOLD COHN AND PARTNERS
P.O. Box 4060
61040 Tel Aviv
ISRAEL

RECEIVED
2 5 -01- 2000
REINHOLD COHN & PARTNERS

Fax
9723560640S

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing (day/month/year)	2 1. 01. 00

Applicant's or agent's file reference 112145.8 RS	**IMPORTANT NOTIFICATION**

International application No. PCT/IL98/00403	International filing date (day/month/year) 24/08/1998	Priority date (day/month/year) 15/10/1997

Applicant
MULTITEXT LTD. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

   The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

   Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

   For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/ European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Bapisch, A Tel.+49 89 2399-2262

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 112145.8 RS	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IL98/00403	International filing date *(day/month/year)* 24/08/1998	Priority date *(day/month/year)* 15/10/1997

International Patent Classification (IPC) or national classification and IPC G06F17/24

Applicant MULTITEXT LTD. et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   I ☒ Basis of the report

   II ☐ Priority

   III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   IV ☐ Lack of unity of invention

   V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement

   VI ☐ Certain documents cited

   VII ☒ Certain defects in the international application

   VIII ☒ Certain observations on the international application

Date of submission of the demand 12/04/1999	Date of completion of this report 21. 01. 00
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Mengele, S Telephone No. +49 89 2399 2720

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-16   as originally filed

Claims, No.:

1-21   as originally filed

Drawings, sheets:

1/1   as originally filed

2. The amendments have resulted in the cancellation of:

   ☐   the description,   pages:
   ☐   the claims,   Nos.:
   ☐   the drawings,   sheets:

3. ☐   This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

2. Citations and explanations

   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

   see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

   see separate sheet

1.   ad section V:

1.1   When the term "text dimension" as given in independent Claims 1, 6, 11 and 16 is
interpreted and clarified in the sense of the description of the present application
(see in particular page 2, line 15 to page 3, line 26), the subject-matter Claims 1,
6, 11, 16 and 21 is neither known from nor rendered obvious by the prior art cited
in the International Search Report:

EP-A-0 230 616 discloses a technique for controlling document versions such as
different versions of computer programming code. In that prior art a so-called SDB
file stores the original document and associated delta records of any changed,
added or inserted lines for each new version created, and a so-called LVC file
contains control record data for each version. That prior art does not suggest to
assign values of "text dimensions" to a selected text segment, in order to
produce a so-called multi-layer text, as it is specified in Claim 1 and Claim 11,
respectively, but rather merely indicates whether given document lines were
deleted, inserted, changed or unchanged compared with the previous version.
The present invention as specified in Claims 6 and 16 provides **simple and fast**
retrieval of text segments **where at least one value of at least one "text
dimensions" is input and text segments are retrieved that have an assigned
value that meets the input value**. In contrast, the cited prior art requires
exhaustive incremental processing of the SDB and LVC files through all interim
versions until a desired document version is created.

Similarly to the first document of the International Search Report, EP-A-0 483 039
concerns version control software. That prior art provides a relational data base
table in which the different versions of data can each have a different engineering
change status, enables users to create versioned objects by logical key grouping
of data elements and acts upon the logical keys and special versioned attributes
of these objects for the proper specification and selection of object instances
during creation, update or retrieval processing.

1.2   Dependent Claims 2 to 5, 7 to 10, 12 to 15 and 17 to 20 specify embodiments of
the respective independent claims to which they refer.

2.   **ad section VII:**

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in EP-A-0 230 616 is not mentioned in the description, nor is this document identified therein.

3.   **ad section VIII:**

The application does not meet the requirements of Art. 6 PCT since the present set of claims is not clear in the following respect:

3.1   Claim 1 is wide enough in scope to cover the case where the method as claimed is performed exclusively by a human being using pencil and paper. It is understood that the method of Claim 1 is computer-implemented. Any different solution is not supported by the description.

3.2   It is understood from the description (see in particular page 2, lines 15 and 16 and page 3, lines 10 to 14) that a "text dimension", as claimed in the independent claims, refers to any desired domain and includes information on one related text layer.

● PATENT COOPERATION TRE●

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

   Filing of amendments and statement under Article 19
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the
   International Search Report; however, for more details, see the notes on the accompanying sheet.

   Where? Directly to the   International Bureau of WIPO
   34, chemin des Colombettes
   1211 Geneva 20, Switzerland
   Fascimile No.: (41-22) 740.14.35

   For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under
   Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the
   applicants's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):**   The applicant is reminded of the following:

   Shortly after **18 months** from the priority date, the international application will be published by the International Bureau.
   If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the
   priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the
   completion of the technical preparations for international publication.

   Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant
   wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

   Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase
   before all designated Offices which have not been elected in the demand or in a later election within 19 months from the
   priority date or could not be elected because they are not bound by Chapter II.

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international pbulication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

    (i)   the claim is unchanged;

    (ii)   the claim is cancelled;

    (iii)   the claim is new;

    (iv)   the claim replaces one or more claims as filed;

    (v)   the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1.   [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2.   [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3.   [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4.   [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 112145.8 RS	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/ IL 98/ 00403	International filing date *(day/month/year)* 24/08/1998	(Earliest) Priority Date *(day/month/year)* 15/10/1997

Applicant

MULTITEXT LTD. et al.

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of _____2_____ sheets.

  [X] It is also accompanied by a copy of each prior art document cited in this report.

1. [ ] **Certain claims were found unsearchable** (see Box I).

2. [ ] **Unity of invention is lacking** (see Box II).

3. [ ] The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing

      [ ] filed with the international application.

      [ ] furnished by the applicant separately from the international application.

            [ ] but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

      [ ] Transcribed by this Authority

4. With regard to the **title**, [X] the text is approved as submitted by the applicant

                       [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

      [X] the text is approved as submitted by the applicant

      [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is:

    Figure No. ___2___ [X] as suggested by the applicant.   [ ] None of the figures.

                      [ ] because the applicant failed to suggest a figure.

                      [ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6   G06F17/24   G06F17/21   G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6   G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 230 616 A (IBM) 5 August 1987 see abstract; claims 1-10 see page 4, line 9 - page 5, line 19; figures 1-3	1-21
X	EP 0 483 039 A (IBM) 29 April 1992 see abstract; claims 1,7 see column 4, line 36 - column 12, line 24	1-21
A	US 5 357 631 A (HOWELL WILLIAM E ET AL) 18 October 1994 see abstract; claims 1-3	1,6,11, 16

☐ Further documents are listed in the continuation of box C.   ☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 December 1998	23/12/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Suendermann, R

Form PCT/ISA/210 (second sheet) (July 1992)

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
EP 0230616	A	05-08-1987	CA	1267236	A	27-03-1990
			JP	62173532	A	30-07-1987
EP 0483039	A	29-04-1992	US	5317729	A	31-05-1994
			JP	4289920	A	14-10-1992
US 5357631	A	18-10-1994	AT	129580	T	15-11-1995
			CN	1073277	A,B	16-06-1993
			CZ	9401299	A	11-06-1997
			DE	69205690	D	30-11-1995
			DE	69205690	T	30-05-1996
			WO	9312498	A	24-06-1993
			EP	0616713	A	28-09-1994
			ES	2078756	T	16-12-1995
			HU	67493	A	28-04-1995
			JP	1979502	C	17-10-1995
			JP	5233628	A	10-09-1993
			JP	6103484	B	14-12-1994
			KR	9612667	B	23-09-1996
			PL	171126	B	28-03-1997
			SK	63394	A	05-10-1994

(51) International Patent Classification 6 : G06F 17/24, 17/21, 17/60	**A1**	(11) International Publication Number: **WO 99/19813** (43) International Publication Date: 22 April 1999 (22.04.99)

(21) International Application Number: PCT/IL98/00403

(22) International Filing Date: 24 August 1998 (24.08.98)

(30) Priority Data:
121990　　　15 October 1997 (15.10.97)　　IL
124579　　　21 May 1998 (21.05.98)　　IL

(71) Applicant *(for all designated States except US)*: MULTITEXT LTD. [IL/IL]; Ben–Yehuda Street 142, 63402 Tel Aviv (IL).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: SOBOL, Idan [IL/IL]; Ben–Yehuda Street 142, 63402 Tel Aviv (IL).

(74) Agent: REINHOLD COHN AND PARTNERS; P.O. Box 4060, 61040 Tel Aviv (IL).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: DEVICE FOR THE GENERATION AND USE OF MULTI–LAYERED TEXT

(57) Abstract

The invention provides for a method for producing a multi–layer text that includes providing a text, selecting a text segment, assigning a value of a text dimension to the text segment and repeating the above steps as many times as desired.

Device for the Generation and Use of Multi-layered Text

FIELD OF THE INVENTION

The present invention is in the general field of text manipulation.

BACKGROUND OF THE INVENTION

5   Texts displayed for reading by means of currently available techniques are "flat" texts. In other words, any alteration in the text involves deleting a letter, word, sentence or paragraph and replacing them with a different letter, word, sentence or paragraph, or adding text and integrating it into the basic text. As a result, the display or printing of the

10 result constitutes effectively, a new text. The displayed or printed result does not preserve or reflect the change and development of the basic text.

In many applications, it is desired to reflect information expressed in several dimensions, e.g. the text that is relevant to specific date or period. Typical example being the law text. The Law undergoes revisions from

15 time to time, and an advocate involved in a lawsuit that refers to events that had occurred at a given period in the past should, preferably, have a convenient means for reviewing the language of the law and regulations that were relevant to the specific dates under consideration. The advocate is not interested in later revisions. In other words, the user or advocate

would like to have a convenient means for displaying a given "layer" of the text which is of interest.

As will be explained in greater detail below, whilst the example above illustrated selection of layer of interest according to time dimension, (i.e. displaying a layer of text which is valid for a given time), other dimensions may be of interest either separately or in combination, e.g. displaying in parliament records, only the text layer that relates to a given spokesperson.

There is, accordingly, a need in the art for providing a convenient means for introducing and displaying layers(s) of text according to selected dimension or dimensions.

GLOSSARY:

There follows a glossary of terms that are used in the specification, some of which are conventional and others have been coined.

1. **Dimension** – A variable applied to a text segment, which includes information on one related level. The dimensions are not limited in definition, quantity or number of assigned values per text segment. An unlimited number of dimensions and values can be defined, meaning that the dimension will serve a great number of terms. The dimensions do not have to be defined for every text segment. A text segment that has no defined dimension will be a non-dimensional text segment.

There follows typical, yet not exclusive, types of dimensions:

A. <u>Dimension of time</u> – the variable that defines the validity in time of a given text segment.

B. <u>Dimension of place</u> – the variable that defines the place where the text was created, occurred, is relevant to, etc.

C. Spokesperson dimension – the variable that defines the text of a given spokesperson.

D. Reference Dimension: a variable that defines the source of text that serves
5   as reference to the text segment under question. Thus, for example, when a given text segment in a patent document originates from a given scientific publication (e.g. a publication from the *IEEE* gazette), the reference dimension that is applied to the text segment in the patent is assigned with the value of the specified scientific publication.

10   Those versed in the art will readily appreciate that the dimension is by no means bound by the latter examples and, in fact, dimension may refer to any desired domain of subject. Thus, by way of non- limiting example, in a play script, a dimension may refer to passages with, say, tragic (first value) or comic (second value) connotations.

15   As will be explained in greater detail below, different dimensions may refer to the same text segment.

It should be noted that the dimension and value thereof do not necessarily form an integral part of the text. Thus, for example, the text
20 segment, "*inner-city fare is 200 shekels*", may be assigned with the value, "*Tel Aviv*" of the place dimension, without that value being part of the text segment.

A text segment may vary from the smallest unit (i.e. word), to any defined text portion (e.g. sentence, a few words, paragraph, etc). It should
25 be noted that a text segment is not confined to any particular linguistic syntax structure.

2. **Dimension Value** – A quantitative value in the definition range that a dimension receives for a text segment, or in other words, the value of a given text.

3. **Range of Values** – The range of values that a dimension may receive. This is of particular relevance to text retrieved.

4. **Status of the dimension value** – The status of the given value is either valid or invalid. Put differently, for various types of dimensions, there need not necessarily be a valid value.

5. **Text segment** – The text portion to which a dimension variable is assigned.

16. **Text** – Information that is saved in a given format, and is constructed of text segments.

7. **Word** – A chain of characters separated by dividers on both sides (valid dividers, punctuation marks or a space).

8. **Type of value continuity** – Defines the behavior of values in the dimension. The permitted types of continuity are as follows:

⬤ **First type:** There may and must only be one valid value that is assigned to a given dimension. The beginning time (say date) of the unit of a new value will cause the former value to close on the specified date minus 1. Time dimension is an example of a first type, seeing that applying an opening date to a segment necessarily entails that the previous text segment expired one day before. Of course, the time dimension is not bound to date and may refer to a different time unit say second, minute, decade etc.

⬤ **Second type:** There are various dimensions that may have either valid or invalid values.

Practically speaking, there are various functions that may be applied when editing a text so as to constitute a multi-layer text, including :

◆ <u>Insert</u> –A function used to insert a text segment into a certain place in the text. This requires to assign dimensions and values to the newly inserted text segment.

◆ <u>End</u> – End actually corresponds to "deletion" of text. The text is not actually deleted, but rather the dimension thereof is rendered invalid.

◆ <u>Author Correction</u> – Enables to correct text (e.g. editorial errors) without affecting the dimension. In other words, the same value of a given dimension applies to the text before and after Author corrections were effected.

Those versed in the art will readily appreciate that the specified functions may be modified and/or others may be added, all as required an appropriate.

SUMMARY OF THE INVENTION:

As specified before, according to prior art, text is displayed in a "flat" (i.e. single layer) form, and reflects the last update. According to the invention, text layering is accomplished by assigning the value of a desired dimension to a selected text segment. As defined above, "dimension" stands for e.g. time, spokesman etc. Thus, by way of example, a given text segment, say a passage in the law, is valid from January 1, 1983 and expires on December 31, 1992. In this example, the text dimension is the time dimension, and the period January 1, 1983 to December 31, 1992 stands for the value range of said time dimension.

Accordingly, the invention provides for a method of producing a multi-level text, comprising

(a) providing a text;

(b) selecting a text segment;

(c) assigning value or value range of a text dimension to said text segment;

(d) repeating steps (b) and (c) as many times as desired.

The present invention further provides for a system that includes display unit for producing multi-layer text, comprising:

(i) selector for selecting a text segment in said text;

(ii) assignor for assigning a value of a dimension to said text segment; and

(iii) memory for storing the multi-layer text

As specified above, text dimension is selected from the group that includes e.g. time, place, spokesperson and reference dimension. Other dimensions may be used, all as required and appropriate.

If desired, after generating the multi-layer text, it may be displayed preferably (although not necessarily), in a manner where each different value of a given text dimension is displayed in unique manner, e.g. in a different color.

Having produced a multi-layer text, the invention provides multitude manners of retrieving and displaying it.

Accordingly, there is provided for use with a multi-layer text of the kind specified, a method for displaying a text of interest, comprising:

(a)　providing at least one input value or input value range of at least one dimension; and

(b)　retrieving and displaying text segments having assigned thereto, a value that meets said input value, or input value range.

BRIEF DESCRIPTION OF THE DRAWINGS:

For a better understanding, the invention will now be described, by way of example only, with reference to the accompanying drawings, in 5 which:

Fig. 1 illustrates a generalized block diagram of a system according to the invention;

Fig. 2 illustrates a flow chart of a generalized sequence of operation for producing a multi-layer text according to one embodiment of the invention; 10 and

Fig. 3 illustrates a flow chart of a generalized sequence of operation for retrieving and displaying text of interest in a multi-level text of the invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

15 Attention is first directed to Fig. 1, illustrating a generalized block diagram of a system according to the invention. As shown, the system (1) includes a processor (2) coupled to memory (4) and to display (6). The processor, memory and display may be any of commercially available devices, e.g. a conventional P.C. running Intel® based processor, and 20 running Windows® based operating system. This is, of course, an example, and any architecture which provides one or more processor coupled to at least one display device and to at least one memory, is suitable for the invention. The processor is loaded from the memory with suitable program and an input text for producing a multi-layer text according to the invention.

The generalized sequence of operation for producing the multi-layer text of the invention is illustrated in the flow chart of Fig. 2., which basically includes the following sequence:

(a) providing a text **(21)**;

5   (b) selecting a text segment **(23)**;

(c) assigning value of a text dimension to said text segment **(25)**;

(d) repeating steps (b) and (c) as many times as desired **(27,29)**.

There follows an example (Table I) which illustrates the resulting
10   multi-layer text.

No.	Text Segment	Dimen. Time	Values	Dimen Place	Values
1	Inner-city bus fare is		Begin-01.01.75 End -~		Tel-Aviv
					London
2	Two lira		Begin-01.01.75 End-31.12.79		Tel Aviv
3	Half pound		Begin-01.01.75 End – 31.12.80		London
4	One hundred		Begin-01.01.80 End-31.12.83		Tel-Aviv
5	Two		Begin-01.01.81 End-31.12.89		London

6	Half shequel		Begin-01.01.84 End-31.12.84		Tel-Aviv
7	One hundred and fifty		Begin-01.01.85 End-31.12.86		Tel-Aviv
8	1.5 new		Begin-01.01.87 End-31.12.89		Tel-Aviv
9.	Three		Begin-01.01.90 End-~		Tel Aviv
					London

TABLE I

As shown in the specified example, only two dimension types are utilized, i.e. time dimension and place dimension.

Time Dimensions	Dimension Place	Resulting Text
Begin-01.01.75 End-31.12.79	Tel Aviv	Inner city bus fare is two lira
Begin-01.01.75 End – 31.12.80	London	Inner city bus fare is half pound
Begin-01.01.80 End-31.12.83	Tel-Aviv	Inner city bus fare is one hundred lira
Begin-01.01.81 End-31.12.89	London	Inner city bus fare is two pounds
Begin-01.01.84	Tel-Aviv	Inner city bus fare is half a shequel

End-31.12.84		
Begin-01.01.85 End-31.12.86	Tel-Aviv	Inner city bus fare is one hundred and fifty shequels
Begin-01.01.87 End-31.12.89	Tel-Aviv	Inner city bus fare is 1.5 New Shequels
Begin-01.01.90 End-~	Tel-Aviv	Inner city bus fare is three New Shequels
Begin 01.01.81 End ~	London	Inner city bus fare is three pounds

TABLE II

Attention is now directed to Fig. 3 illustrating a flow chart of a generalized sequence of operation for retrieving (31) and displaying (33) text of interest in a multi-layer text of the invention. As shown, the 5 multi-layer text of the kind specified enables to retrieve and display a text of interest by, generally, following the steps:

(a) providing at least one input value, or input value range, of at least one dimension; and

(b) retrieving and displaying text segments having assigned thereto, 10 each, value or value range that meets said input value, or input value range.

Considering, the example of Table II above, an illustrative query could be "*How much does an inner-city bus ride cost on the date (03 10 1981) in a certain city*"?

The relevant input values are, of course, *03 10 1981* (time 15 dimension) and *Tel-Aviv* or *London* (place dimension). What remains to be done is to retrieve the text segment that corresponds to the specified input

values i.e. *three pound* in London (since *03 10 1981* falls in the range of *01 01 1981 -)* and *one hundred lira* in *Tel-Aviv (*since *03 10 1981* falls in the range of *01 01 1980 - 31 12 1983*).

As clearly shown in Table II, a text segment need not necessarily be assigned one value. Thus, in Fig. 2, the same text segment is associated with two values belonging to time and place dimensions, respectively.

There follows an example which will assist in clarifying the so called "second type" of continuity:

Thus, if there is dimension that shouldn't have value all the time, and it can have more than one value at given time period, like employment for example (one is not always employed), then each validity period of any value should contain start and termination of validity, for example:

The next sentence is part of text that has the employment dimension; the values are as follows:

Text	validity begins	Validity terminates
I am	01/01/1990	~
not	21/12/1995	24/02/1996
employed	01/01/1990	~
by	01/01/1990	20/12/1995
	25/02/1996	~
Firm A	01/01/1990	20/12/1995
Firm B	25/02/1996	20/03/1998
&	20/01/1998	20/03/1998
Firm C	20/01/1998	~

Now if one looks how the text is present at different periods, one can see that:

1.   The text will appear as of 01/01/1990: **I am employed by firm A.**

2.   The text will appear as of 01/01/1996: **I am not employed.**

3.   The text will appear as of 01/01/1990: **I am employed by firm A & firm B.**

The behavior of the employment dimension values is as follows:

10

Value	01/90	02/90	12/95	01/96	02/96	03/96	12/97	01/98	02/98	03/98	04/98
Firm A	+++++	+++++	+++								
Firm B					+	+++++	+++++	+++++	+++++	+++	
Firm C								+	+++++	+++++	+++++

As clearly shown, there is no value in the period of 21/12/1995 until 25/02/1996, and there is multi-value in the period between 20/10/1998 until 20/03/1998.

15   With this example, the idea that dimension need not necessarily have valid value at all times is demonstrated.

Those versed in the art will readily appreciate that there are multitude manners of displaying text of interest, and three out of many possible variants are discussed below.

1.   <u>Define a requested value (value range) dimension of a text segment.</u>
If, for example, a dimension of time in an updated law text is sought, the
law in force at any requested date X will be displayed. The retreival
program, based on the input values, will automatically choose all text
5 segments that correspond to the criterion of: expiration _date = X, and only
the requested segment(s) will be displayed.

2.   <u>Display text changes according to different values of the same</u>
<u>dimension.</u> If all changes made in a selected passage of text during the
period Y are of interest, the display program will automatically select all
10 segments concerning the chosen text and display them e.g. as a set of
windows, a separate window for each segment. It is, thus, possible to see
the modification of the information along the selected dimension (in this
case, the dimension of time). When the dimension is time, it is possible to
view the modifications in a synchronized display and examine the changes
15 made on a specific date throughout the text. Alternatively, it is possible to
select a diachronic display and see all the alterations made to a certain
segment of the text within a given range of dates. Other variants are, of
course, applicable.

3.   <u>A complete visual display.</u> In this case, the text will be marked with
20 a different color for each period of validity. For example: a word valid from
January 1, 1990, will be printed in color A (the color assigned to the date
January 1, 1990). A word valid from January 1, 1991 will be printed in
color B (the color assigned to the date January 1, 1991). If a word colored
in A expires on January 1, 1991, it will be marked with an overstrike in
25 color B (the color chosen for the date January 1, 1991). By following this
technique, the reader will be able to determine the date on which each word
became valid, and the date on which it ceased to be valid. By viewing the
text which is not marked with an overstrike, the reader will be able to read
the full text as at the date of the last update.

As previously mentioned, no hitherto known technique is capable of conferring additional layering information to a text (e.g. in a simple text file format), utilizing basically, although not necessarily, standard word processing functions.

5   The invention enables the recording of text and the provision of text dimensions with various values. According to these values, it is possible to define text derivatives, and dynamically display them according to user demand.

According to the invention, it is possible to review various layers
10   and dimensions that reside in the text.

The invention is by no means bound by any specific implementation for accomplishing text layers and retrieving information from the multi-layer text. Thus, by way of example, if two adjacent text segments have the same value, the system may automatically form the two segments
15   into one segment having a common value. By way of another example, the invention is not bound by any given user-interface that serves for establishing multi-layer text or for accomplishing text retrieval.

One, non limiting, example of realizing a time dimension is given below, (where date values reside between the /* ... */ signs, and wherein B
20   stands for starting date and E stands for ending date:

/*B01.07.1976-E01.01.9999*/   small business entity – "business entity which does not employ more than two employees and its turnover in all
25   business does not exceed
350,000 /*B01.07.1976-E01.08.1979*/ LIRA'S
200,000 /B01.08.1979-E01.04.1983*/

/*B01.04.1983-E01.01.1987*/800,000/*B01.08.1979-E01.01.1987*/

SHEKEL /*B01.01.1987-E01.08.1988*/50,000

/*B01.08.1988-E01.04.1989*/60,000 /*B01.04.1989-E01.01.1990*/70,000

/*B01.01.1990-E01.01.1991*/85,000

5   /*B01.01.1991-E01.10.1991*/100,000

/*B01.10.1991-E01.01.1993*/120,000

/*B01.01.1993-E01.01.1994*/130,000

/*B01.01.1994-E01.01.1995*/150,000

/*B01.01.1995-E01.01.1996*/170,000

10   /*B01.01.1996-E01.01.9999*/185,000 /*B01.01.1987-E01.01.9999*/NEW

....SHEKEL/*B01.07.1976-E01.01.9999*/,

The specified example is parsed to the following information (presented as

15   a table)

The relevant text	Effective to	Effective from
small business entity – "business entity which does not employ more than two employees and its turnover in all business does not exceed	1.1.9999	1.7.1976
350,000	1.8.1979	1.7.1976
LIRA'S	1.8.1979	1.7.1976
200,000	1.4.1983	1.8.1979
800,000	1.1.1987	1.4.1983
SHEKEL	1.1.1987	1.8.1979
50,000	1.8.1988	1.1.1987
60,000	1.4.1989	1.8.1988
70,000	1.1.1990	1.4.1989
85,000	1.1.1991	1.1.1990
100,000	1.10.1991	1.1.1991
120,000	1.1.1993	1.10.1991
130,000	1.1.1994	1.1.1993

150,000	1.1.1995	1.1.1994
170,000	1.1.1996	1.1.1995
185,000	1.1.9999	1.1.1996
NEW SHEKEL	1.1.9999	1.1.1987

The updated text for 1.1.1998, reads as follows:

small business entity – "business entity which does not employ more than

5 two employees and its turnover in all business does not exceed 185,000

new shekels

It should be noted that order of steps recited in the claims is provided

for convenience of explanation only and should by no means be regarded as

binding.

10 The present invention has been described with a certain degree of

particularity but it should be understood that various modifications and

alterations may be made without departing from the scope or spirit of the

invention as defined by the following claims:

CLAIMS:

1.   A method for producing a multi-layer text, comprising

(a) providing a text;

(b) selecting a text segment;

5   (c) assigning value of a text dimension to said text segment;

(d) repeating steps (b) and (c) as many times as desired.

2.   The method of Claim 1, wherein said text dimension is selected from the group that includes time, place, spokesperson and reference.

3.   The method according to Claim 1, further comprising the step of
10 displaying said multi-layer text, such that different values of a text dimension are displayed in unique manner.

4.   The method according to Claim 3 wherein each one of said values is displayed in a different color.

5.   The method according to Claim 1, wherein said values are assigned
15 to said text segment using at least one of the following functions: INSERT, END, AUTHOR CORRECTION.

6.   For use with a multi-layer text, the multi-level text having text segments assigned with values of text dimensions; a method for displaying a text of interest, comprising:

20   (a) providing at least one input value, or input value range, of at least one dimension; and

(b) retrieving and displaying text segments having assigned thereto, value that meets said input value, or input value range.

7.   The method of Claim 6, wherein said text dimension is selected from
25 the group that includes time, place, spokesperson and reference.

8.   The method of Claim 6, wherein said retrieval includes displaying a requested value, or value range of a dimension of a text segment.

9.   The method of Claim 6, wherein said retrieval includes displaying text changes according different values of the same dimension.

5   10.   The method of Claim 6, wherein said retrieval includes a complete visual display.

11.   A system that includes display unit for producing multi-layer text, comprising:

    (i)   selector for selecting a text segment in said text;

10   (ii)   assignor for assigning a value of a dimension to said text segment; and

    (iii)   memory for storing the multi-layer text

12.   The system of Claim 11, wherein said text dimension is selected from the group that includes time, place, spokesperson, reference.

15 13.   The system of Claim 11, wherein said display device is capable of displaying said multi-layer text, such that different values of a text dimension are displayed in a unique manner.

14.   The system according to Claim 13, wherein each one of said values is displayed in a different color.

20 15.   The system of Claim 11, wherein said values are assigned to said text segment using at least one of the following functions: INSERT, END, AUTHOR CORRECTION.

16.   For use with a multi-layer text having text segments assigned with values of text dimensions, a system for displaying a text of interest,
25 comprising:

i.   receiver for receiving at least one input value or input value range of at least one dimension; and

ii.   retriever for retrieving and displaying text segments having assigned thereto, value that meets said input value, or input value range.

17. The system of Claim 16, wherein said text dimension is selected from the group that includes time, place, spokesperson and reference.

18. The system of Claim 16, wherein said retrieval includes displaying a requested value, or value range of a dimension of a text segment.

19. The system of Claim 16, wherein said retrieval includes displaying text changes according different values of the same dimension.

20. The system of Claim 16, wherein said retrieval includes a complete visual display.

21. A memory medium containing a file that includes a multi-layer text generated according to the method of Claim 1.
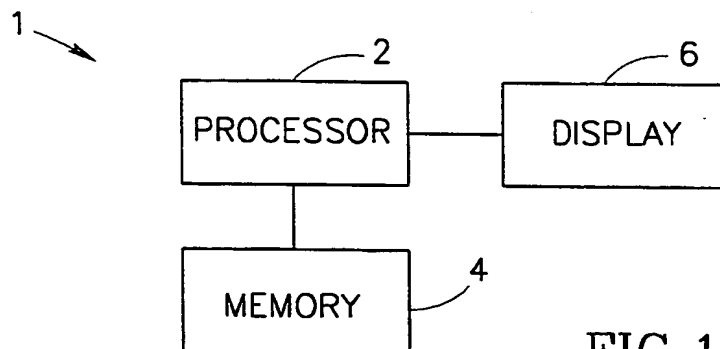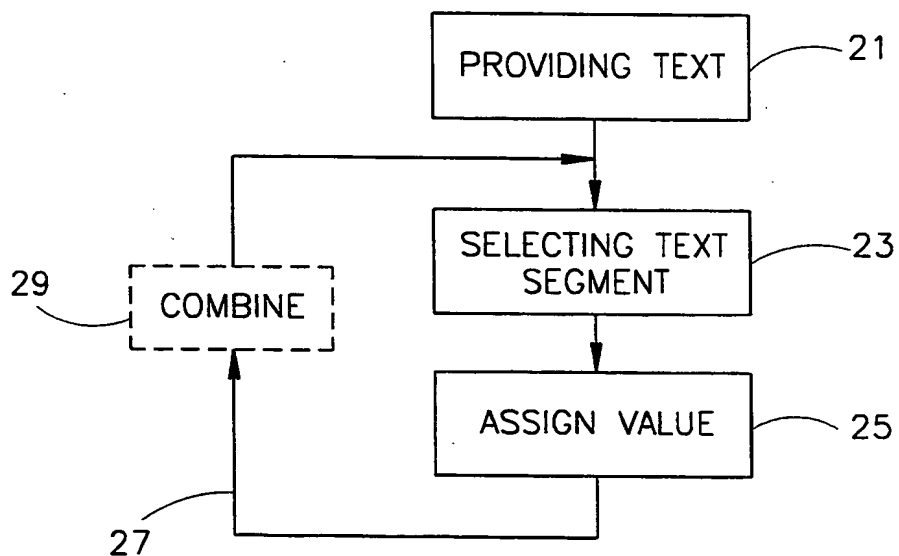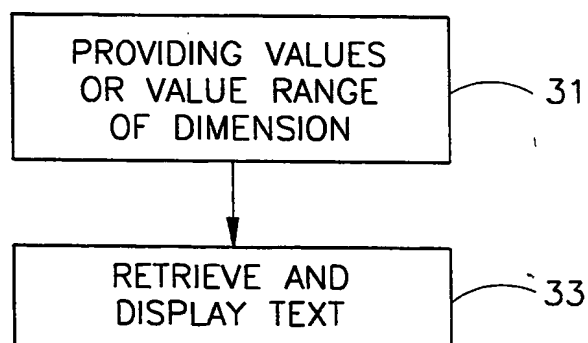
1/1

FIG.1

FIG.2

FIG.3

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6   G06F17/24   G06F17/21   G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6   G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 230 616 A (IBM) 5 August 1987 see abstract; claims 1-10 see page 4, line 9 - page 5, line 19; figures 1-3 ---	1-21
X	EP 0 483 039 A (IBM) 29 April 1992 see abstract; claims 1,7 see column 4, line 36 - column 12, line 24 ---	1-21
A	US 5 357 631 A (HOWELL WILLIAM E ET AL) 18 October 1994 see abstract; claims 1-3 -----	1,6,11, 16

☐ Further documents are listed in the continuation of box C.   ☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 December 1998	23/12/1998

Form PCT/ISA/210 (second sheet) (July 1992)

1

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EP 0483039	A	29-04-1992	US	5317729 A	31-05-1994
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